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ABSTRACT

In order to reduce pollution, secure long-term energy needs, retard the depletion of non-renewable resources, and harmonize industrialization with the vulnerable environment, Polish universities are directing their efforts toward intensification of ecological education and intensification of research activities. Its efforts are connected with COPERNICUS (Cooperative Programme in Europe for Research on Nature and Industry through Coordinated University Studies.) In the area of ecological education, the problems of ecology and environmental protection are being emphasized in curricula and textbooks for biology, geography, and chemistry. Course offerings and specializations on environmental protection are increasing. Polish universities are participating in five governmental research programs concerning protection of the natural environment, soil erosion and methods of its prevention, protection and control of selected species of animals, optimization of water economics, and fish farming. The Baltic Project is a focal point of international research, in recognition that the large and complex system of land, air, and water of Baltic Europe is losing its capacity to maintain fresh air, clean water, and noncontaminated food. The economic development of Poland and proper international collaboration are vital for Polish universities to fulfill their important mission in these projects. (JDD)

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The mission of the university in economic development and environmental preservation : management of local and regional resources in an interdependent world system

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THE MISSION OF THE POLISH UNIVERSITIES IN ENVIRONMENTAL PRESERVATION

by
B.K.Mazurkiewicz

1.Introduction

Poland is a country which due to its geographical location experiences all negative effects of the development of modern civilisation.Polish rivers,particularly Vistula and Odra,being water - courses collecting all industrial and municipal wastes,present today more or less a sewer transporting polluted water into the Baltic Sea which is no more an open sea for people treating it mainly as a recreation area.

In addition the air pollution caused by industrial emissions reached a level which is already very dangerous for people in many regions of our country,particularly in the Silesia Region,the main industrial area of Poland.

Independent on the global disturbances to the environment such as the destruction of the ozone layer and climate changes the actual situation in Poland,causing serious negative influences on human health and significant economical losses,requires steps to reverse negative trends as soon as possible and to maintain and significantly increase the environmental protection related improvements already taking place.It is also evident that to obtain visible results in economic development and environmental preservation,a strengthening of collaboration among countries being immediate neighbours should take place while the collaboration should concern all possible institutions among others and particularly the universities.

The universities in Poland are today forced to answer the following questions:

How can we harmonize a rapidly growing industrialization with our vulnerable environment on which we vitally depend ?

How can we sufficiently reduce the pollution of air,waters and soil ?

How can we secure,in the long run,our energy needs ?

How can we retard or stop the depletion of non-renewable resources ?

We are not able today to answer these questions and we still do not possess a valid idea how an economic system will look like with the sustainability of the earth´s ecosystem.Looking at the ecological problems we do not even consider a dramatic reduction of the industrial production and individual consumption.

In Poland we are all aware that solving the above problems is much more important than only just understanding them.However, instead of seeking ways to prevent ecological degradation by more considerate and intelligent measures and reasonable moderation in life-style,we try to intensify the activities to repair the damages while the goal is a reduction of environmental stress and increase conservation of row materials and energy.

Considering the presented situation,the Polish universities are directing their efforts on two main domains,namely,intensification of ecological education and intensification of research activities devoted to the estimation of the degree of pollution or contamination of air,water and soil with the elaboration of methods of environment restoration.This is of course connected with the estimation of economical consequences taking account of the present economical development of the country.

All the above activities are connected with the international cooperation recently subordinated to the project COPERNICUS (COoperative Programme in Europe for Research on Nature and Industry through Coordinated University Studies) being a special project of the Conference of European Rectors (CRE),the organization of European universities.

2.Ecological education

Concerning the ecological education it might be stated that in Poland during the last decade above all,radical changes have been made in curricula and textbooks particularly concerning biology, geography and chemistry in which the problems of ecology and environmental protection have got a great importance.

Additionally the new education methods developed at the universities present to pupils and students new requirements,namely:

a) to understand the dependencies between the elements of the environment,

b) to predict the chain reactions in the case of changes in the environment introduced due to excessive intervention of people

c) to be able to search for solutions of any ecological problem,and

d) to have the capacity to follow the principles of environmental protection and of rational use of the natural goods and resources.

The education in ecology and environmental protection has no tradition in our country.Therefore in education of teachers and other skills,as well as in laboratory equipment for the realisation of modern curricula we have still sensible deficiency.Thus it is expected that in the frame of the project COPERNICUS through the exchange of teaching staff and students between Eastern and Western European Universities it will be possible to promote the dissemination of teaching material and their integration into various curricula,as well as to benefit from study in another country.

The mission of the university is here clear - the preparation of local staff,laboratories and regional resources particularly in the frame of COPERNICUS project to obtain an educational system which can be introduced as a part of the world system available particularly for countries changing their economy and political structure.As an addition the development of teaching modules for a basic interdisciplinary course in environmental management has to be mentioned.

To sum up the situation at the Polish universities in the field of education in ecology and environmental protection it has to be mentioned that actually in all ten Polish universities in which teaching biology and geography is taking place,graduates have the knowledge of the contemporary problems concerning the natural environment and its use,as well as its protection.

In Polish technical universities teaching takes place among others on systems of atmosphere protection (Warsaw and Wroclaw) and on systems of the whole natural environment (air,water,soil surface) protection and restoration (Warsaw,Cracow,Wroclaw,Gdańsk, Białystok).

At the agricultural academy in Olsztyn students graduate in biological protection of water.

The above number of universities in which the teaching on environmental protection takes place,as well as the possible number of specializations in which students can graduate are still insufficient.It is foreseen that in the near future postgraduate studies will be launched,although several questions are raised today concerning mainly available means for organisation and management of these studies.

Generally it is expected that in the frame of the project COPERNICUS,as well as other programmes e.g.TEMPUS,the Polish universities will obtain certain support to organize studies on environmental protection and restoration in all levels and specializations.

This will mean that the mission of Polish universities in environmental preservation,possible only when the expected economic development will take place,might be fulfilled.

3.Research activities

The Polish universities have in the last years actively participated in five governmental research programmes concerning protection and forming of the natural environment,soil erosion and methods of its prevention,protection and control of selected species of rare and good of hunting animals and optimisation of water economics and fish farming in the conditions of deteriorating natural environment.

These programmes are insufficient when considering the today requirements concerning monitoring of the degree of pollution and detection of pollution sources,and concrete actions mainly for restoration of the natural environment.Also the problem of efficient and fast purification methods of sewage and neutralization methods of waste materials were not until now the subject of proper investigations on the university level.This means that in the very near future these problems must be the subject of a very intensive research in the universities,however,in close cooperation on the national and international level.

Recently a real chance exists through launching of the so-called Baltic Project being part of the project COPERNICUS of CRE.

The Baltic Project as an entity,geographically outlined by the borders of the drainage area consists of what has been called

"Baltic Europe".Such an extension does also coincide with public commitments to protect the environment as enshrined in the Helsinki Convention.

The large and complex system of land,air and water of the Baltic Europe is degrading losing its capacity of maintaining fresh air,clean water and noncontaminated food.At the same time the Baltic Sea is one of the most investigated larger seas in the world with long-time.series of important hydrographical variables.The mode of exploitation of natural resources is a function of cultural history and with the seven diverse nations surrounding the Baltic,representing both different cultures and different political ideologies,the Baltic Europe offers most of the main problems mankind is now facing. The region's ecological conditions are furthemore shaped by complex interactions with outside areas,particularly through the atmosphere.

All the above different aspects are equally important in creating a colourful and dynamic whole.Thus a question can be raised, namely,what other institutions than universities with their research networks and diverse and fast information flows are better equipped to improve our knowledge of such complex processes and suggest ways of transforming the area to a sustainable environment ?

International cooperation within Baltic marine research exists since the 60s.Within the framework of the Helsinki Commission continuous monitoring of the international waters and periodic assessment of the state of the Baltic Sea is carried out.During the last years a mathematical,dynamic,predictive model of the total Baltic has been developed.However,this is all insufficient.For example as the first step a refinment of the above model incorporating toxic substances and more realistic data from the South-Eastern part of the Baltic should take place in collaboration with universities in Poland,Balticum and Leningrad.It can be stated that a properly functioning model is a prerequisite for a future,safe pollution contr

Further problems which should be the subject of international collaboration of universities are:

a) precipitation measurements,
b) river loads of critical substances,
c) sediment mapping,
d) coastal-offshore transport of critical matter,
e) modelling.

Generally speaking the future research is a transdisciplinary one with a focus on the couplings between the regimes:land,atmoshere

and water to a dynamic whole.As land use is a function of historical-cultural processes the Baltic Project area must concern a whole spectrum of disciplines from human geography and economics to the biogeosciences.It means that the sustainability of the Baltic Europe is a property belonging to this very project.

Summing up one can state that the expected intensification of ecological research activities treated as the nearest and important mission of Polish universities seems to have now the chance to be fulfilled,namely,in the frame of the Baltic Project covering the whole Poland area being inside the Baltic Sea drainage area.

As mentioned at the beginning the realisation of the project will depend mainly on the economic development of the country,as well as possibility of proper international collaboration particularly in management of all available resources.Let´s hope that the present development of Poland will be a good prognosis for Polish universities trying actively to fulfil their important mission.